Week5

HBase Installation

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1 Summary

In this week, HBase, including standalone, pseudo-distributed and fully-distributed modes, are successfully set up. Besides, the java source codes of hbase are compiled and tarball is generated manually. Lastly, source code and patch related to the HBase bug - HBASE-9737 is read and analyzed.

2 HBase Installation

2.1 Stanalone (Mac OS X)

Standalone mode is the default mode for HBase. In this mode, HBase does not use HDFS, instead, it uses the local filesystem. It runs all HBase daemons and a local ZooKeeper all up in the same JVM.
Guide(hbase-1.2.6):
standalone hbaset

2.2 Pseudo-Distributed (Mac OS X)

Pseudo-Distributed mode means that all daemons run on a single node. This configuration is to test and prototype on HBase. We won't use this configuration for production nor for evaluating HBase performance.

First, set up HDFS in pseudo-distributed

Next, configure HBase by modifying pseudo-distributed HBase

Note

- Distributed Filesystem master(fs.default.name) and MapReduce Master(mapred.job.tracker) should be set on the same host but different ports.
- To make your life easier, please let HBase manage Zookeeper quorum on localhost. You can bind the clientPort to 2222(default is 2181). Ensure HBASE_MANAGE_ZK is commented out or set to true in conf/hbase-env.sh and then edit conf/hbase-site.xmland set hbase.zookeeper.property.clientPort and hbase.zookeeper.quorum.
- Let HBase create thehbase.rootdir directory.

2.3 Fully-Distributed (emulab)

A fully-distributed mode is the distributed mode run on multi-node cluster. Before proceeding, we must ensure HDFS is working correctly. In order to facilitate our experiment for bug injections, we set up fully-distributed HBase in two versions on emulab. The cluster topology is show in hadoop.ns

2.3.1 New Version–Hadoop 2.7.1 + HBase 1.2.6

Thanks to the tutorial of UCARE, fully-distributed Hadoop 2.7.1 can be installed with zero errors. Then, by following the official website, Hbase is set up successfully.

Note

- Host and port of hbase.rootdir must be consistent with that of fs.default.name
- It is recommended to run a ZooKeeper ensemble of 3, 5 or 7 nodes(hbase.zookeeper.quorum). In our case, we set node-1, node-2, node-3 as a zookeeper ensemble and leave the namenode node-0 alone.
- It is more convenient to test and maybe more realiable to set master host also as a datanode. In out case, we also add node-0 in conf/slaves.
- Three ways are given for HDFS Client Configuration in HBase official web. The best practice is to copy hdfs-site.xml in ${HADOOP_HOME}/conf to ${HBase_HOME}/conf
- Make sure that you have permission to the file ${HBase_HOME}/logs/SecurityAuth.audit, otherwise HBase will run into error when restarted.
- Do not forget to set up mapred-site.xml in ${HADOOP_HOME}/conf.

2.3.2 Old Version–Hadoop 1.0.3 + HBase 0.94.12

The installation instruction for hadoop 1.0.3 is well adressed by Mr.Michael. The configuration of HBase 0.94.12 is same with that of HBase 1.2.6.

Note

- Do not format a running cluster because this will erase all existing data in the HDFS filesytem!
- According to HDFS-107, you may observe the error "java.io.IOException: Incompatible namespaceIDs" . A simple way to solve this problem is to stop the full cluster, delete the data directory on the problematic datanode: the directory is specified by dfs.data.dir in conf/hdfs-site.xml, and then reformat the namenode.
- Make sure you have permission to hadoop log files that you defined in dfs.data.dir and dfs.name.dir. If you do not, please change permission by commnd – chown.
- Make sure you have replaced all ${HADOOP_HOME} by ${HADOOP_PREFIX} in your .bashrc if you use bash or .bash_profile otherwise. ${HADOOP_HOME} is deprecated in hadoop 1.0.3.

2.3.3 Confirming Installation and Compatibility

Usually, we can judge if Hadoop is running correctly by checking java processes. we can type 'jps' in the shell to see all running java processes. As for HBase, we can check by playing around the HBase shell by creating, populating or droping tables. See hadoop tutorial and hbase official website .

HBase 0.94 and earlier versions cannot be set up correctly against hadoop 2.0.x because of ICP version incompatibility. But you can build through mvn.

3 Building Apache HBase

we have successfully compiled java source code of hbase and generated tarball in OS X. we referred to building hbase. But we will put stress on fully-distributed hbase in next step.

4 Next Step

Next week, we will firstly understand the work flow of the hbase bug - HBASE-9737 by adding 'print' code and operating files in hbase. Then we will trigger the bug by handling corrupt files.